

THE LARVA OF *MICROSTIGMUS COMES*,
WITH COMMENTS ON ITS RELATIONSHIP TO
OTHER PEMPHREDONINE GENERA
(HYMENOPTERA, SPHECIDAE)*

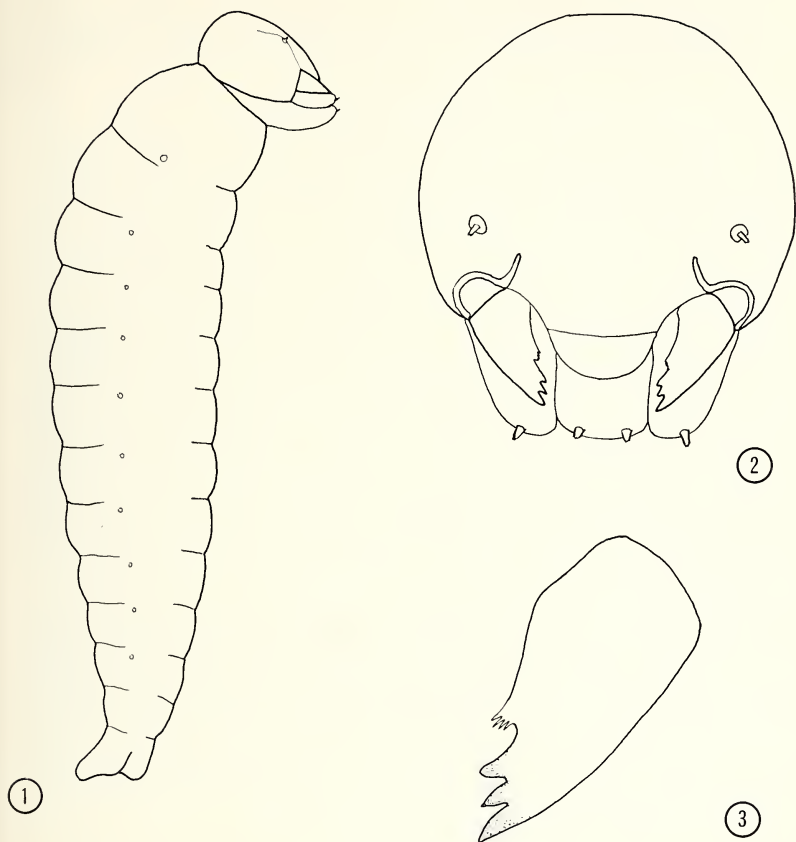
BY HOWARD E. EVANS AND ROBERT W. MATTHEWS
Museum of Comparative Zoology

Compared to other Sphecidae, members of the Pemphredoninae exhibit an unusually wide spectrum of morphological features. Larval characters have suggested that simple division of the subfamily into the two tribes Psenini and Pemphredonini may not be ideal. (For discussion and for previous descriptions of the larvae of Pemphredoninae, or references thereto, see Evans, 1958, pp. 128-136; Evans, 1959, pp. 139-145, 167-168; and Evans, 1964, pp. 245-253.) Recently, larvae of another member of this group were obtained in the course of studies on the nesting biology of *Microstigmus comes* Krombein (see Matthews, 1967). Because, in addition, the genus exhibits many unique behavioral features, consideration of the larva and possible relationships of *Microstigmus* seem particularly appropriate. No previous larval descriptions exist for the genus; Myers' (1934) drawings of the body and mandible of the larva of *M. theridii* fail to illustrate critical characters and hence are of little use to this discussion, although the features shown essentially agree with those of *M. comes* larvae.

Description of mature larva of *Microstigmus comes* Krombein
(Figures 1 to 3)

Length 4 mm; narrowly fusiform, gradually tapered posteriorly, apical segment conically produced above the anus. Body slightly constricted at the intersegmental lines, more noticeably dorsally. Integument smooth, visible spines or setae absent even under high magnification. Spiracles minute, atrial walls completely smooth, entrance into the very slender subatrium unarmed. Head .47 mm wide, .44 mm long measured to apical margin of clypeus (about as long as wide when measured to apical margin of labrum); head devoid of setae and completely unpigmented except for the three brown apical mandibular teeth; parietal bands absent. Antennal orbits large, subcircular, about 55μ in diameter; antennal papillae well developed, about 25μ long. Labrum short, its apical margin

*Manuscript received by the editor April 6, 1968



Microstigmus comes Krombein, mature larva. Fig. 1. Lateral view. Fig. 2. Head, anterior view. Fig. 3. Mandible.

evenly arcuate; labrum apparently completely without setae or sensoria, but epipharynx bearing numerous weak but fairly large spinules visible under high magnification. Mandibles without setae, rather broad basally, each tapering to a tridentate apex, the inner margin also with an unpigmented process which terminates in several (usually four) slender papillae. Maxillae large, apparently completely smooth and without setae or spinules; galeae absent; palpi conical, about 20μ long. Labium broad, smooth, and rather blunt; palpi widely separated, slightly shorter and blunter than maxillary palpi; spinnerets apparently lacking.

Preserved specimens have been deposited in the collection of the U. S. National Museum.

Discussion

Spilomena and *Microstigmus* share the following features: setae absent from both body and head; antennal papillae present; labrum semicircular, without an apical emargination or pigmented bands; mandibles with three strong apical teeth in the same plane; and galeae absent (said to be present but minute in *S. vagans*). *Ammono-planus* larvae also have antennal papillae, tridentate mandibles and no galeae, but the head has many setae and the labrum is slightly emarginate. These similarities suggest that *Microstigmus* is closely related to *Spilomena* and somewhat more distantly related to *Ammono-planus*. These three genera are quite distinct from the Pemphredonini (*Pemphredon*, *Passaloecus*, *Xylocelia* and *Stigmus* larvae have been described), which possess galeae, lack antennal papillae, have four strong mandibular teeth, and have the labrum broad and apically emarginate. However, the possibility exists that these lines of distinction may be blurred as the larvae of additional pemphredonines become known.

In addition to the above, the larva of *Microstigmus* evidences several unique features which are no doubt associated with the unusual biology of this genus. These include the conical supranal process, possibly an adaptation for obtaining purchase in the walls of the cell, and the apparent complete absence of spinnerets, which correlates with the loss of the cocoon in this genus. The spinulose lobe on the inner margin of the mandible is also unique and may be a modification for feeding upon Collembola.

LITERATURE CITED

EVANS, H. E.

1958. Studies on the larvae of digger wasps. Part IV: Astatinae, Larrinae and Pemphredoninae. Trans. Amer. Ent. Soc., **84**: 109-139.
1959. Studies on the larvae of digger wasps. Part V. Conclusion. Trans. Amer. Ent. Soc., **85**: 137-191.
1964. Further studies on the larvae of digger wasps (Hymenoptera, Sphecidae). Trans. Amer. Ent. Soc., **90**: 235-299.

MATTHEWS, R. W.

1967. Nesting biology of the social wasp *Microstigmus comes* (Hymenoptera, Sphecidae, Pemphredoninae). Psyche, in press.

MYERS, J. G.

1934. Two Collembola-collecting crabronids in Trinidad. Trans. Roy. Ent. Soc. London, **82**: 23-26.